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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,947	11/15/2001	Andrew Charles Powis	13DV14224	5940

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EXAMINER

NGUYEN, NINH H

ART UNIT PAPER NUMBER

3745

DATE MAILED: 10/22/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/998,947

Applicant(s)

POWIS ET AL.

Examiner

Ninh H. Nguyen

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– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-12 is/are allowed.
- 6) ☒ Claim(s) 1-3,5,13-17 and 19 is/are rejected.
- 7) ☒ Claim(s) 4,6 and 18 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,5. 6) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claim 17 is objected to because of the following informalities:

On line 2 of the claim Applicant recites the limitation of “an upstream airfoil vane and a down stream airfoil vane, said downstream airfoil vane is downstream from the upstream airfoil vane”. First, as disclosed in paragraphs [0011] and [0012] on page 3 of the specification, the airfoil vanes of a nozzle of a gas turbine are arranged side by side circumferentially, not axially. Secondly, in a gas turbine as shown in application Fig. 1, the hot gas flows axially from upstream location 28 to a downstream location 30 of the turbine. Therefore, the limitation of the upstream airfoil vane is upstream of the downstream airfoil vane is inconsistent with the direction of gas flow in a gas turbine as disclosed by Applicant.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. Claim 17 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for lack of antecedent basis for the limitation “said leading airfoil vane” and “said trailing airfoil vane” on lines 4 and 5, respectively.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 5, 13-16, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Emery et al. (6,318,963) in view of Durgin et al. (4,297,077).

Emery et al. inherently disclose a turbine nozzle (Figs. 1, 2) and a method of assembling a turbine nozzle for a gas turbine engine, the nozzle comprising a pair of identical airfoil vanes 8 coupled by at least one platform 4 that is formed integrally with the airfoil vanes, each airfoil vane comprising a first sidewall 18 and a second sidewall 20 connected at a leading edge 22 and a trailing edge 24 to define a cavity therebetween; and at least one insert 14 configured to be inserted within the airfoil vane cavity and comprising a first sidewall 14a and a second sidewall 14b, the insert first sidewall comprising a first plurality of openings 45 extending therethrough for directing cooling air towards at least one of the airfoil vane first and second sidewall, the insert second sidewall comprising a second plurality of openings extending therethrough for directing cooling air towards at least one of the airfoil vane first and second sidewalls;

However, Emery et al do not disclose the first plurality of openings configured to facilitate more vane sidewall cooling than the second plurality of openings.

Durgin et al. teach a hollow turbine vane 10 (Figs. 1, 2) having an airfoil having first sidewall 14 and second sidewall 16 connecting at a leading and trailing edges, an insert 26 adapted to be inserted into the hollow vane wherein the insert having an insert first side wall and an insert second sidewall; a plurality of first and second cooling openings 30 formed on the insert first and second sidewall, respectively for cooling of the vane wherein the plurality of first openings are configured to facilitate more vane sidewall cooling than the second plurality of

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openings (Fig. 2) since the vane sidewall corresponding to the first insert sidewall is in more direct contact with hot motive fluid and thus requires more cooling (col. 2, lines 50-56).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made, to make the turbine nozzle of Emery et al. with the first plurality of openings configured to facilitate more vane sidewall cooling than the second plurality for the purpose of cooling the corresponding vane sidewall that is in more direct contact with hot motive gas as taught by Durgin et al.

5. Regarding claims 3 and 14-16, Emery et al. in view of Durgin et al. disclose all the limitations except the airfoil vane first sidewall does not define an airfoil vane convex suction side, and the airfoil vane second sidewall does not define an airfoil vane concave pressure side; and the airfoil vane suction sidewall is not provided more cooling than the airfoil vane pressure sidewall as claimed.

Durgin et al. provide more cooling capability on the airfoil vane suction sidewall because in the particular turbine of Durgin et al. the airfoil vane pressure side is more in direct contact with hot motive gas than the suction side (col. 2, lines 50-56).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made, as an engineering expedience, to make the airfoil vane of Emery et al. in view of Durgin et al. with the suction side wall having more cooling capability than the pressure side wall to provide more cooling to the airfoil vane suction sidewall than the pressure sidewall in case the suction sidewall is in more direct contact with hot motive gas than the pressure sidewall for the purpose of cooling the airfoil vane efficiently.

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Regarding claim 19, Emery et al. in view of Durgin et al. provide cooling to the turbine nozzle inherently to reduce thermal stresses within the nozzle.

Allowable Subject Matter

6. Claims 7-12, due to the limitation of directing cooling air to the airfoil nozzle such that the nozzle trailing airfoil is cooled more than the leading airfoil, are allowed.

7. Claims 4, 6, and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. Claim 17 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph and the objection, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Information Disclosure Statement (IDS)

The IDS submitted on 11/15/01 cited references pertaining to rescuing tools, which is totally irrelevant to the turbine art and therefore, is not considered.

Prior Art

The prior art made of record but not relied upon is considered pertinent to applicant's disclosure and consists of 2 patents.

Peill (4,252,501) and Suzuki (4,697,985) are cited to show different turbine airfoil cooling schemes.

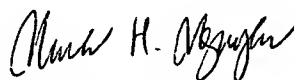
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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Ninh Nguyen whose telephone number is (703) 305-0061. The examiner can be normally reached on Monday-Friday from 8:00 A.M. to 5:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Look, can be reached at (703) 308-1044. The fax number for this group is (703) 305-3588.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0861.



Ninh H. Nguyen
Patent Examiner
Art Unit 3745

Nhn
October 21, 2002